CENTER FOR SOLID OXIDE FUEL CELL TECHNOLOGY

CENTER

The Center for Solid Oxide Fuel Cell Technology (CSOFC) was established in 1996. The main focus of the Center is to develop solid oxide fuel cell (SOFC) technology for the direct conversion of chemical energy of a variety of fuels, such as natural or coal gas and other reformed logistic fuels, into electricity at a very high efficiency. Initially, the Center is developing cell stack technology for a 2 to 5 kilowatt unit, which has many potential applications with emphasis on distributed power for residential and remote locations for on-demand electrical power that is clean, efficient, reliable, and noise-free.

TECHNOLOGY

CSOFC technologies are based on the design and fabrication of novel, anode-supported solid oxide fuel cells with highly efficient electrodes that have a very low resistance. This concept makes it possible to develop a cost-effective, compact power unit for direct conversion of chemical energy of fuels into electricity for remote and residential applications.

ACCOMPLISHMENTS

A patent on the development of novel electrodes for SOFC was issued. Fuel cells that operate at lower temperatures but higher efficiency are being developed. Strategic business partners are being sought. Discussions are in progress with two Utah companies for the development and eventual commercialization of SOFC. The Center has been successful in attracting research and development grants from federal agencies as well as the Electric Power Research Institute (EPRI) and the Gas Research Institute (GRI). A low cost process for the fabrication of corrugated anode cell structure has been developed, which allows the stacking of 4 to 6 cells. Technology consortiums have been formed in partnership with EPRI and GRI. A strategic commercialization relationship with a local company Materials and Systems Research Inc. (MSRI) is under development.

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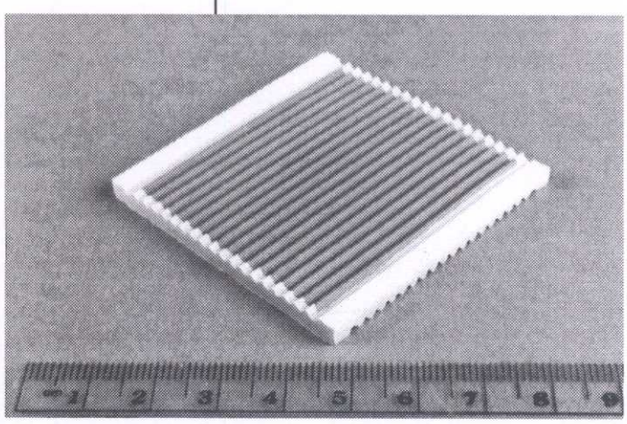
Can You Imagine...

. . . a portable generator you can take on your next camping trip that efficiently converts propane directly to electricity with no flame, no moving parts, no noise, and only carbon dioxide and water vapor as exhaust pollutants?

THE CENTER EXPLORES COMMERCIALLY VIABLE METHODS OF CONVERTING GASEOUS FUELS DIRECTLY INTO ELECTRICITY USING HIGHLY EFFICIENT FUEL CELL TECHNOLOGIES.



- Photo of a 5cm x 5cm solid oxide fuel cell (SOFC) made by the Center. The corrugations for the flow of fuel (e.g. natural gas) and oxidant (e.g.air) are in a cross-flow arrangement. The dark top surface is the cathode. SOFCs such as these are currently being configured into a stack. The objective is to construct a 2 to 5 kW stack for residential applications. The SOFC system will convert chemical energy of a variety of fuels into electricity.